

BOGE AIR. THE AIR TO WORK.



Operating instructions

**BASIC compressor control
for screw compressors**



www.boge.com



Operating instructions BASIC compressor control for screw compressors

**BOGE KOMPRESSOREN
Postfach 10 07 13
33507 Bielefeld**

**Otto-Boge-Straße 1-7
33739 Bielefeld**

**Fon: +49 5206 601-0
Fax: +49 5206 601-200
Mail: info@boge.com
Net: www.boge.com**

Issue: 02 / 2011
No. 596.1010.01
Nominal price: € 5,00

Index

Part 1: BASIC

1.1	The BOGE control concept	1
	General	1
	Microcontroller	1
	Ease of servicing	1
	Operating and control panel	2
1.2	Operating elements	3
1.3	Operation	6
1.4	Control parameterization	11
	Error key table	11
	General	12
	Parameterization	12
	Set the compressor servicing interval and zero the counter	13
	Set the motor servicing interval and zero the counter	13
	Set receiver inspection load cycles and restart	13
	Start leakage measurement	13
	Change pressure target values (p _{max} and p _{min})	15
	External output enable	16
	Change after-running time	16
	Set continuous mode	16
	Enable network independent ON-OFF memory (Auto-Restart)	17
	Anti-freeze idling (only in mode: Ready for operation)	17
	Motor switching limitation	17
	Star phase time control	18
	Idling control with extremely short operating time (option)	18
	Service request	18
1.5	Faults	18
	General	18
	Automatic monitoring of the control systems	18
	Fault messages of the control	19
	Warning messages of the control	21

1.1 The BOGE control concept

General

These operating instructions describe the BASIC control system.

BASIC is an integrated control and monitoring concept, having two objectives:

- Energy savings and thus reduction of ongoing costs.
- Prolonging the service life of the compressor due to wear which is as low as possible.

All programmed data is stored in a memory module (EEPROM). Thus the stored information is even available following a power failure.

Microcontroller

The BOGE control concept dynamically adapts to the respective operating conditions. A microcontroller assumes the following three tasks:

1. Automatic selection of the most economical operating mode

In order to save operating costs, it always strives for the most economical intermittent operation.

2. Automatic optimization of the motor switching cycles

The microcontroller calculates the optimum number of motor switching cycles. This protects the drive motor and prolongs the service life of the system.

3. Automatic reminder of the maintenance intervals

The microcontroller monitors the maintenance intervals.

Ease of servicing

Rapid replaceability of the controls in the event of failures increases the availability of the compressor. This eliminates time consuming and costly trouble shooting by specialists.

Operating and control panel

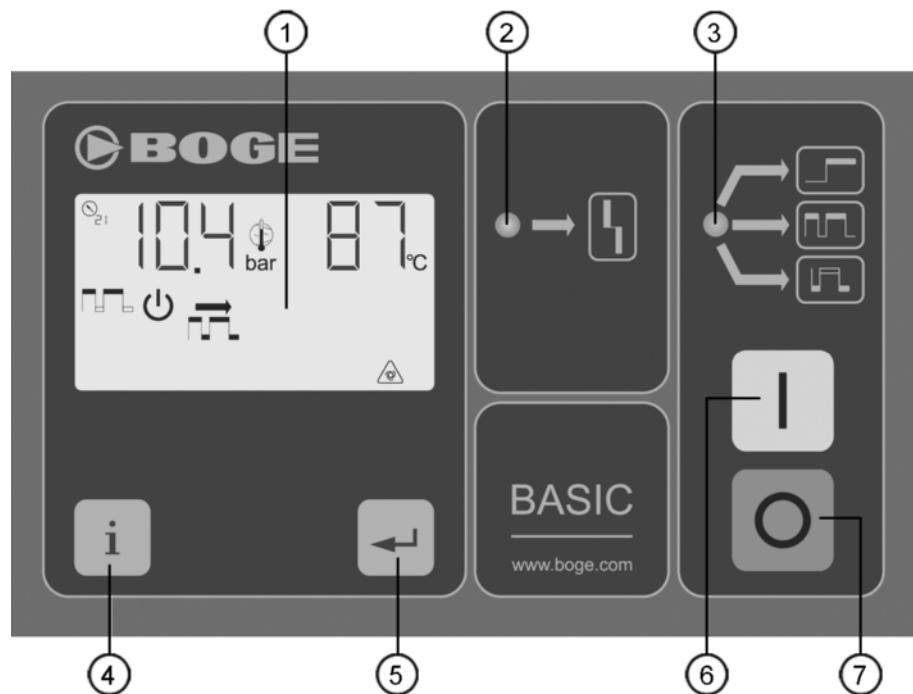


Fig. 1.1: BASIC operating panel

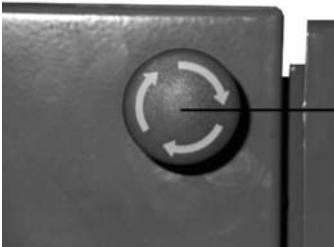
- 1 LC display
- 2 Indicator lamp – Fault (red)
- 3 Indicator lamp – Ready (green)
- 4 **INFO key** 
- 5 **ENTER key** 
- 6 **ON key** 
- 7 **OFF key** 

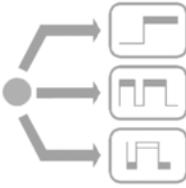


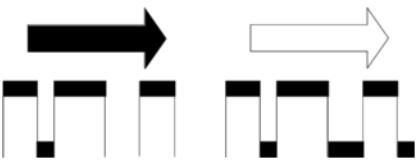
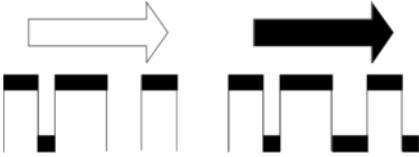
EMERGENCY STOP
1 EMERGENCY STOP button

Fig. 1.2: EMERGENCY STOP button

1.2 Operating elements

Operating/control element	Function	Operation/Explanation
EMERGENCY STOP button 	To switch off the compressor in an emergency	<ul style="list-style-type: none"> Press the EMERGENCY STOP button (1). The Emergency Stop button engages and interrupts the control voltage. All displays are cut off from the power. <p>After rectifying the fault, unlock the EMERGENCY STOP button:</p> <ul style="list-style-type: none"> Turn the EMERGENCY STOP button a quarter turn clockwise. Quit the display test by pressing the OFF key . The compressor is ready for operation again. <p>Attention! Always switch the compressor off with the OFF key . Only use the EMERGENCY STOP button in case of an emergency!</p>
EMERGENCY OFF switch  Only for CLF series with supply disconnecting device and EMERGENCY OFF function	To switch off the compressor in an emergency	<ul style="list-style-type: none"> Turn the EMERGENCY OFF switch (2) (supply disconnecting device) to the left, '0' and the supply voltage is disconnected. All displays are cut off from the power. <p>After rectifying the fault, turn EMERGENCY OFF switch to the right into position '1':</p> <ul style="list-style-type: none"> Quit the display test by pressing the OFF key . The compressor is ready for operation again. <p>Attention! Always switch the compressor off with the OFF key . Only use the EMERGENCY STOP button in case of an emergency!</p>
ON key 	To switch the compressor on	<ul style="list-style-type: none"> Press the ON key : <p>The operating status depends on the network pressure:</p> <ol style="list-style-type: none"> Network pressure greater than lower cut-in pressure. Compressor remains ready. Network pressure lower than lower cut-in pressure. Compressor starts and changes to load after a few seconds.
Off key 	To switch the compressor off	Compressor may continue to run for 30 seconds in idling mode.
INFO key 	Select desired information	<ul style="list-style-type: none"> Press the INFO key . The display shows the next set of information.

Operating/control element	Function	Operation/Explanation
ENTER key 	For confirmation during parameterization	– see section „Control parameterization“ on page 11.
Indicator lamp – Ready (green) 	Ready	The green lamp indicates that the machine is ready.
Indicator lamp – Fault (red) 	Fault	The red lamp indicates a fault.
	Network pressure display	Pressure gauge or target value (network).
	Parameterization	If parameterization has been started, this symbol appears in the top left of the display.
3-digit 7-segment display P:  bar	Display: Pressure	Shown in bar with a decimal point between the second and third digit.
3-digit 7-segment display T:  °C	Display: Temperature	Measured in °C.
 Thermometer		Operation below 0°C.
	OFF or motor or receiver	The circle stands for three functions: 1. The compressor is switched off 2. For motor servicing period 3. Servicing symbol (receiver inspection) (replace wearing parts).
	Standby	Automatic standby phase.

Operating/control element	Function	Operation/Explanation
	Idle	(Automatic) idling phase.
	Load run or load speed	Output phase or output cycle.
	Automatic operating mode selection	Automatic mode with standby phases enabled.
	Continuous operation	Automatic mode without standby phases enabled.
	Total operation time	Total motor operating hours.
	Idle operation time	Idle operating hours.
	Servicing due	Information on current or impending servicing.
	Auto-Restart (automatic restart enabled after network failure)	Energy-independent ON-OFF save function set.
	External output enable	Remote output enable (e.g. by MCS).
		– Remote ON-OFF (e.g. from control panel) – not used here .
		Online – not used here .

1.3 Operation

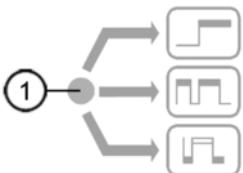
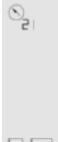
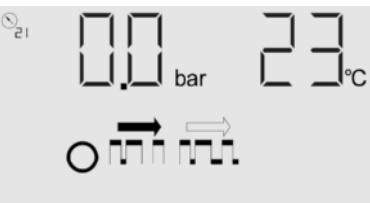


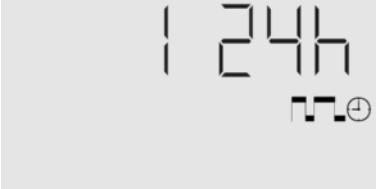
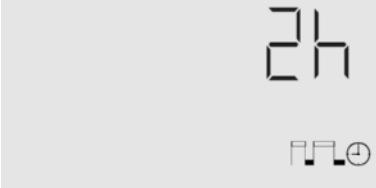
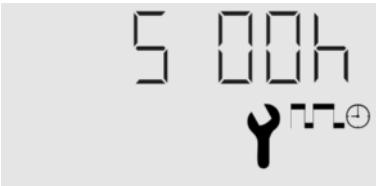
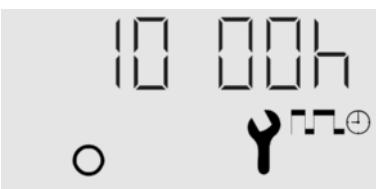
Caution! Risk of injury!

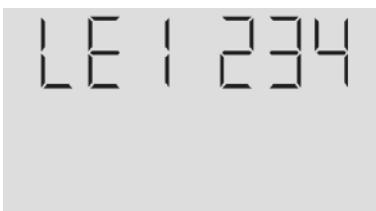
If the compressor is not closed there is a risk of injury due to rotating or projecting parts resp. a crushing hazard because of flaps or doors standing open!

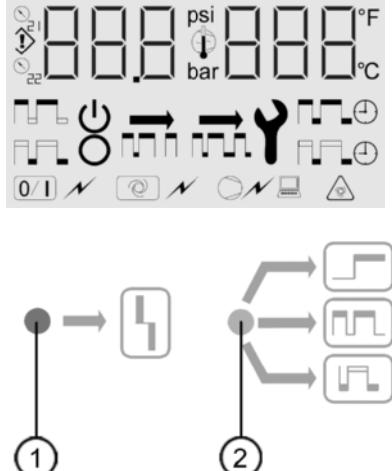
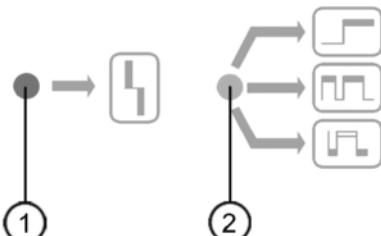
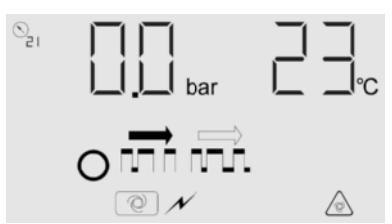
The compressor may only be operated with all flaps and doors closed!

Operating/control element	Function	Operation/Explanation
<p>1 Indicator lamp – Fault (red) 2 Indicator lamp – Ready (green)</p>	Function control of display elements	<ul style="list-style-type: none"> After unlocking the EMERGENCY STOP button and turning on the supply voltage, all enableable display elements of the control appear at the same time – including the two indicator lamps. If standby was not saved (no Auto-Restart), this status must first be ended by pressing the OFF switch (1), before the compressor can be switched on. Otherwise the symbol (2) at the bottom right flashes, it disappears automatically after a set time and the compressor is on standby again without touching the controls.
	Main display	<ul style="list-style-type: none"> This display appears automatically after completion of the network failure phase (as described under display element function control): The network pressure is shown at the top left (pressure gauge 21), and at the top right the (final compression) temperature. In the centre appear the two operating mode curves: the left arrow shaded (as shown here) = automatic mode selection, right = continuous operation. The circle left of this means: Off here. The symbol at the bottom left is for setting <i>external output enable</i> and the symbol for <i>cut-in save</i> (Auto-Restart) is shown at the bottom right. These two symbols only appear when the respective setting has been made.

Operating/control element	Function	Operation/Explanation
  1 Indicator lamp – Ready (green)	Switch on the compressor	If no fault is reported, pressing ON key  will switch on the green indicator lamp (compressor on standby) which means: the pressure control function is activated.
	Power-up phase	The pressure control starts the motor if required → the idling symbol  appears during the time-controlled star phase (the star contactor is switched on first followed by the network contactor 20 ms later). The idling symbol  also appears for 30 seconds after reaching the set maximum pressure.
	Delta switching	The star phase is automatically ended and a change to delta switching started (the star contactor drops and 60 ms later the delta contactor cuts in), the valve status Load is switched on and the  symbol is shown in the display.
	Standby	After the set maximum pressure is reached, the <i>idling</i> symbol  appears, in most cases for 30 seconds. If during this time the pressure drops to below the set minimum pressure, the compressor switches back to load and the respective symbol is displayed again. Otherwise the control unit switches the motor off and the <i>Stand by</i> symbol  is shown in the display.
 	Switch off the compressor	Press OFF key  → Compressor Off → the pressure control function is deactivated and the display shows the idling symbol  for up to 30 seconds. During this time the green indicator blinks. The symbol  then appears and the green indicator lamp goes out.

Operating/control element	Function	Operation/Explanation
	Fault	If the control unit detects a fault , the compressor is switched off immediately and <u>automatically</u> – without an idling phase –, the fault relay drops and a number on the right of the current pressure blinks together with the red indicator lamp: The blinking number indicates the detected fault (see also section „Error key table“ on page 11).
Operation, servicing periods, display test and software-no.		
 means: 124 h total up-time	Total hours	Press Info key  → and the segment display shows the total operating time in hours , together with the total up-time.
 means: 2 h idling time	Idling hours	Press Info key  a second time → and the display shows the Idling time counter and the Idling symbol..
 means: 500 h until next compressor servicing	Compressor servicing interval	Press Info key  a third time → and the display shows the operating time until the Compressor servicing and the Running time and Servicing symbols (spanner).
 means: 1000 h until next motor servicing	Motor servicing interval	Press Info key  a fourth time → and the display shows the operating time until the next Motor servicing and the symbols O running time and servicing (spanner).

Operating/control element	Function	Operation/Explanation
 means: $20 \times 10^3 = 20000$ load cycles until next receiver servicing.	Check wearing parts	Press Info key  a fifth time → and the display shows the <i>1000-output cycle servicing counter</i> with the single exponent 10^3 ($x 1000$), the load speed symbol, the circle (here for the receiver) and the servicing symbol (spanner), meaning the number of possible output cycles until the next <i>wearing parts inspection</i> (Suction regulator).
	Single leakage measurement	Press Info key  a sixth time → now the display shows the value for the single leakage measurement (LE). The abbreviation LE stands for "single leakage measurement". The displayed value shows the annual operating load times due to leakage.
	Continuous leakage measurement	Press INFO key  a seventh time → now the display shows the value for the continuous leakage measurement (Lc/LC). The abbreviation Lc stands for "continuous leakage measurement". The displayed value shows the annual operating load times due to leakage. When the abbreviation LC is displayed, continuous measurement has been carried out for more than a week.
 means: $p_{max.} = 10.0$ bar	Upper target pressure value	Press INFO key  an eighth time → and the segment display shows the <i>Upper target pressure</i> and an underscore at the top right next to.
 means: $p_{min.} = 9.0$ bar	Lower target pressure value	Press INFO key  a ninth time → and the segment display shows the <i>Lower target pressure</i> and an underscore at the bottom right next to it.

Operating/control element	Function	Operation/Explanation
  1 Indicator lamp – Fault (red) 2 Indicator lamp – Ready (green)	Display element test	Press INFO key  a tenth time → and the display shows all symbols and segments together with the two indicator lamps.
 bedeutet Software-Nr. 1105	Software no.	Press INFO key  an eleventh time → and the segment display area shows the <i>Software no.</i>
		Press INFO key  one more time → to return to the <i>main display</i> . If no key is pressed for five minutes, the main display automatically reappears.
	Software version no.	Meaning
	0xx xxx	Screw compressor, all sizes
	1xx xxx	Screw compressor up to 22 kW with frequency converter
	2xx xxx	Screw compressor bigger than 22 kW with frequency converter
	3xx xxx	Piston compressor
	x1x xxx	Type of pressure sensor = 0.5 ... 4.5 V

1.4 Control parameterization

Error key table

Error no.	Meaning	Compressor cut-out
0	not assigned here	
1	Final compression temperature > 110°C, 230°	X
2	Motor temperature too high	X
3	not assigned here	
4	not assigned here	
5	System pressure too high	X
6	not assigned here	
7	not assigned here	
8	not assigned here	
9	not assigned here	
10	Motor servicing due	
11	Compressor servicing due	
12	not assigned here	
13	Frequency converter and/or fan motor gives error message	X
14	Temperature too low	X
15	Suction control ¹⁾	
16	Network pressure transmitter faulty	X
17	not assigned here	
18	Fault of an external control	
19	Previous net switch-on phases were too short (possible reasons: coil short-circuit "solenoid valve" or "delta contactor") → automatically increased delay time in corr. with permissible number of motor switch cycles	
20	Continuous contact of an external control	
21	Receiver or wearing parts inspection due	
22	not assigned here	
23	not assigned here	
24	not assigned here	

Error no.	Meaning	Compressor cut-out
25	Control unit EEPROM / reconciliation error	X
26	not assigned here	
27	Control unit ON key  does not open	X
28	not assigned here	
29	Control unit ENTER key  does not open	
30	not assigned here	
31	not assigned here	
32	not assigned here	

¹⁾ Parameterization of external output enable necessary if no infinite output control is available

General

The control unit calculates from the current operating data the respective best operating mode and automatically selects it. The parameters are adjustable. In order to prevent unintentional changes to pre-set parameters, these parameters are codeword-protected.



Caution!

Never change the value of a parameter if you do not know what it means! This may cause incorrect behaviour of the control unit!
Do not experiment with parameter settings!
Always call BOGE-Service if you are unsure or have any doubts.

Parameterization

From the main display the first step in parameterization is performed by repeated pressing of the **INFO key** , until the display the software-no., and then proceeding as follows:

1. Press **ENTER key**  → and the parameterization symbol  is shown on the left, followed by three zeros, the left of which blinks.
2. Press **INFO key**  to change the first digit.
3. Press **ENTER key**  → and now the middle zero blinks.
4. Press **INFO key**  to change the second digit.
5. Press **ENTER key**  → and now the middle zero blinks.
6. Press **INFO key**  to change the third digit.
7. Press **ENTER key**  → the display will now branch off depending on the set number – if the value is invalid the main display will reappear.

Set the compressor servicing interval and zero the counter

To make changes easier, the respective setting is changed in large steps.

1. Enter **Code 111**, as described under parameterization (see page 12) → and the display shows, as already described, the compressor servicing interval in blinking digits.
2. Press the **INFO key**  to change the value.
3. Press **ENTER key**  to overwrite the non-volatile EEPROM with the blinking value, and the main display reappears.

Set the motor servicing interval and zero the counter

To make changes easier, the respective setting is changed in large steps.

1. Enter **Code 222**, as described under parameterization (see page 12) → and the display shows, as already described, the motor servicing interval in blinking digits.
2. Press the **INFO key**  to change the value.
3. Press **ENTER key**  to overwrite the non-volatile EEPROM with the blinking value, and the main display reappears.

Set receiver inspection load cycles and restart

To make changes easier, the respective setting is changed in large steps.

1. Enter **Code 333**, as described under parameterization (see page 12) → and the display shows, as already described, the receiver inspection interval in blinking digits.
2. Press the **INFO key**  to change the value.
3. Press **ENTER key**  to overwrite the non-volatile EEPROM with the blinking value, and the main display reappears.

Start leakage measurement

This function serves to enable you to determine the energy loss resulting from any potential leaks in your compressed air network.

To this purpose, the control unit measures the time period duration of the operating loads during which, under normal circumstances, no production of compressed air takes place, as for example over night or operation downtimes.

This, however, is conditioned on the fact that operational compressed air production be discontinued for a protracted period of time and that the compressor be set into the "ready" mode by means of the control system. In case of a potential pressure reduction below the preset minimum pressure value resulting from leaks in the compressed air network, this compressor automatically switches into the operating mode in order to recover the set pressure range. The leakage measurement serves to record the duration of the operating load times and to extrapolate them for the whole year. This allows you to quantify any leakages and to easily determine their portion of additional costs due to any energy losses.

A potential leakage is either measured by a **single (LE) or continuous (Lc/LC) value measurement**:

In case of **single leakage measurement** a **single** measurement operation over six hours serves to determine the hourly operating load times per year due to leakage.

In order to obtain a precise value it is imperative that no operational compressed air consumption take place during measurement, viz. production is to be shut off for at least six hours. If measurement is actuated by means of the control system, measurement will be deferred by six hours. This allows you to activate the leakage function already in the afternoon causing the measuring operation to start in the evening (six hours later) to continue over night.

Unlike continuous value measurement, single value measurement is also possible if several compressors are being operated in the basic load mode at the same time. Starting separate single value measurement of each compressor enables you, after a six-hour measurement period, to read and to add up all of the single values of the compressor control units. Their total value corresponds to the annual number of hours of operating load times as a result of leakage in your compressed air networks.

Continuous leakage measurement is designed to **continuously** calculate operating load values at six-hour intervals.

Unlike single leakage measurement, continuous leakage measurement can also be started during current daily production with measurement starting at once. The first value obtained after a six-hour period will probably be distorted since any operational compressed air production will be added to any potential leakage related operating load. Most probably, however, no operational production will be in effect during any subsequent value measurement. The then obtained value, which is exclusively due to leakage, will be smaller than the first obtained value. The control system is designed to always display the smallest value of all measurements, in this case, however, the last obtained value. This means that any distorted calculation of production operating loads will be excluded.

In order to determine exact leakage measurement values make sure that, during a time frame of 12 hours, there will in all probability be no operational compressed air production.

Start leakage measurement

Single leakage measurement will not start but six hours after actuation of this process. You are therefore requested to make sure

- that, after the deferred start of the measurement process no operational compressed air production will take place over a period of six hours.
- that the compressor is set into the "ready" mode by means of the control unit and that the green LED of the control is lit.
- that, when using the "external flow release" the external flow release may not be shut off neither manually nor by the switch clock

In order to start single measurement:

1. Call up „Single Leakage Measurement“ in the display (see “Single leakage measurement” on page 9).
2. Press **ENTER key** .

The number **9999** appears and single value measurement will start in six hours. After a period of twelve hours, the single measurement value will be displayed. This value will be saved until a new measurement process is carried out.

If, after having started measurement, a power failure takes place the number **9980** will be displayed. In such case it is recommended to repeat the measurement process at a later stage.

If, during measurement, the compressor is put out of operation the number **9990** will be displayed, i.e. the compressor is switched off and the energy loss due to leakage could not be properly determined during said measurement. In this case, too, the measurement process should be repeated at a later stage while making sure that the compressor be switched off during measurement.

Start continuous measurement

Continuous leakage measurement will start immediately. Make sure

- that during the following days, at least for once during a time frame of 12 hours, no operational compressed air production takes place;
- that the compressor be set into the "ready" mode by means of the control unit and that the green LED of the control be lit

In order to start continuous measurement:

1. Call up „Continuous Leakage Measurement“ in the display (see “Continuous leakage measurement” on page 9).
2. Press **ENTER key** .

The number **9999** appears next to Lc. Continuous measurement will start immediately and keep being carried out. After the twelve-hour time frame, during which no operational production has taken place, has been exceeded a sound measurement value is obtained.

The control system will always save the lowest value. A search for the lowest value – as a background process – will be restarted once a week. This allows, after expiry of another week, a higher value compared to the one of the previous week to be displayed if the measured minimum value has increased during that period. Any potential increase of leakages in the compressed air network will therefore also be possible to be determined.

Any power failures during measurement will not be indicated by a sequence of digits because new values will be calculated every six hours and because any such power failure during measurement will not prevent the values of the subsequent measurement to be displayed.

Change pressure target values (p_{\max} and p_{\min})

If changes are made to these target values, the value of P_{\min} is automatically held or brought outside any applicable minimum hysteresis range.

1. Enter **Code 360**, as described under parameterization (see page 12) → and the display shows, as already described, the upper target pressure value, but blinking.
2. Press **INFO key**  to change the value.
3. Press **ENTER key**  to overwrite the non-volatile EEPROM with the blinking value, and the lower target pressure value appears (blinking).
4. This value can now be changed by pressing the **INFO key** .
5. Press **ENTER key**  to overwrite the non-volatile EEPROM with the blinking value, and the main display reappears.
6. It is not permissible to set the bottom pressure target value below the stipulated p_{\min} value. In case this should be necessary please contact BOGE-Service beforehand.

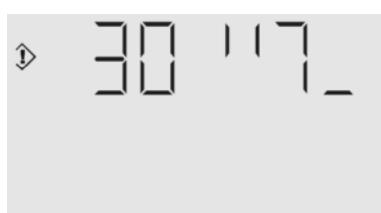
External output enable



If the output of a compressor is to be enabled by a higher level control unit, its parameterization must be changed as follows:

1. Enter **Code 210**, as described under parameterization (see page 12) → and the display shows illustration ①.
The 'square' at the top right blinks. This display means: no additional enabling device is programmed.
2. Press **INFO key [i]** to change to display ② (or press again to toggle back...).
The 7-segment-range blinks. This display means: an enabling device (e.g., MCS) is programmed.
3. Press **ENTER key [■]** to overwrite the non-volatile EEPROM with the blinking value, and the main display reappears.
If the compressor is set for an output enabling device, the bottom of the main display shows the appropriate symbol . The following applies even with external enabling: if the upper target pressure value in the compressor is exceeded, the output will be shut off. Only when the the pressure drops to the lower target pressure value does external control resume.

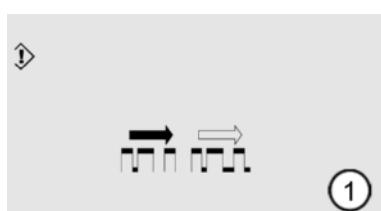
Change after-running time



For compressors that are seldom in operation there is an option to change the after-running time:

1. Enter **Code 019**, as described under parameterization (see page 12) → and the display shows the figure on the left.
The number 30 blinks. The quotation mark symbol here stands for seconds. A run-out curve is indicated on the two right positions.
2. Press **INFO key [i]** to change the value.
3. Press **ENTER key [■]** to overwrite the non-volatile EEPROM with the blinking value, and the main display reappears.

Set continuous mode



If pressure drops in relatively small receiver/pneumatic network volumes must be avoided at any price, continuous operation can be set as follows:

1. Enter **Code 733**, as described under parameterization (see page 12) → and the display shows illustration ① left.
The shading of the left arrow blinks. This means: automatic power economy operating mode selection.
2. Press **INFO key [i]** to change to illustration ② (press again to toggle back...).
The shading of the right arrow blinks. this means: continuous operation.
3. Press **ENTER key [■]** to overwrite the non-volatile EEPROM with the blinking symbol, and the main display with the selected symbol appears.

Enable network independent ON-OFF memory (Auto-Restart)



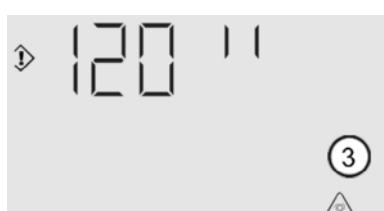
Caution!

With automatic restart (Auto-Restart) the compressor restarts automatically after a power failure.

Condition: the network pressure is lower than the set cut-in pressure and it was switched on beforehand.

Using energy independent memory for remembering ON-OFF:

Normally a compressor always assumes an OFF status directly after an electrical power failure.



However, there is an option to automatically restart the compressor with a set delay after a power failure. This is done as follows:

1. Enter **Code 134**, as described under parameterization (see page 12) → and the display shows illustration ①. The 'line' at the top right blinks. This display means: no remembering of On-Off status (standby) after a power failure.
2. Press **INFO key** to change to illustration ②, (press again to toggle back...): The 'curve' at the top right blinks. This display means: remember the On-Off status (Auto-Restart).
3. Press **ENTER key** to overwrite the non-volatile EEPROM acc. to the blinking symbol. If the top symbol was selected, the main display is shown. Otherwise illustration ③ on the left is shown. The number 120 blinks. The quotation mark symbol here stands for seconds.
4. Press **INFO key** to change the value. **ENTER-Taste** to overwrite the EEPROM with the blinking value and the main display appears with the symbol at the bottom right.

Anti-freeze idling (only in mode: Ready for operation)

The compressor is set to automatically start an idling phase from standby when the temperature drops to below +4°C, and to remain idling until reaching +20°C final compression temperature.

Motor switching limitation

Motor switching limitation is only activated when the air requirement makes it necessary, ie, after the "Motor start count per quarter hour" is reached before time.

Only now does it switch from intermittent to a limited continuous operation – **synchronous DB control**. The control unit calculates the through time so that on the one hand the maximum allowed switch count per 12 minutes can not be exceeded, and that unnecessary idling times can be saved on the other.

Star phase time control

The star time is fixed in the control unit according to the type of compressor.

Idling control with extremely short operating time (option)

If the compressor switches automatically (e.g., on reaching the upper target pressure level) from load to idling, it continues to run until the after-running time (max. 655 sec.) is reached.

To change the after-running time see section „Change after-running time“ on page 16.

Service request

The main display shows a blinking *spanner*.

- all other functions are unchanged.

If the **INFO key**  is pressed, the display only shows the blinking service request number and the spanner.

Press **ENTER key**  to acknowledge the request. If necessary (see also message key table) one of the three servicing interval back-counters must be reset to its start value as under the respective service interval setting or receiver inspection load cycle setting, and changed or confirmed by pressing **ENTER key** .

Pre-acknowledgement

If a service message is acknowledged, the cause of which has not (yet) been attended to, the spanner symbol continues to appear (but no longer blinking).

1.5 Faults

General

The tables on the following pages give information on the possible causes of operating faults and measures for their rectification.

**Caution!**

Ensure that any work required to rectify faults is only carried out by trained personnel or specialists. Ensure that components which have a safety function are only set, repaired or exchanged by BOGE Service!

Please contact BOGE-Service at the following telephone number, if you have any questions.

Telephone: +49 5206 601-0

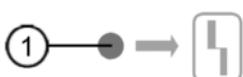
Automatic monitoring of the control systems

All data is stored in a memory module (EEPROM).

If a fault occurs while the data stored in the EEPROM is being read, the control system will react as follows:

- The compressor is switched off.
- The following fault message appears in the display.

Fault messages of the control



1 Indicator lamp – Fault (red)

If the control unit registers an Error, the compressor is immediately and

- without an idling phase – automatically shut down. The error relay drops and on the right next to the actual pressure value there blinks a number next to the red indicator lamp:
- the blinking number indicates the registered cause (see also section „Error key table“ on page 11).

Acknowledge messages

Display the message – e.g. by pressing the **INFO key** . Press **ENTER key** to cancel the display and acknowledge the message. The main display appears, if the cause for the fault was rectified.

Overview fault messages

FAULT	Possible cause	Rectification
1 	Ambient temperature too high	Employ suitable measures to improve the air inlet and ventilation in the installation room
	Cooling unit soiled	Clean cooling unit externally
	Insufficient cooling air quantity	Keep air inlet opening to the compressor clean; check to ensure that any existing cooling air duct systems are adequately dimensioned
	Insufficient oil quantity	Top up oil
	Temperature sensor defective or wire break	Replace temperature sensor or repair the wire break

2 	Motor overload! Excessive winding temp. due to under-voltage	Ensure correct voltage conditions: Constant voltage in accordance with IEC 38
	Insufficient motor cooling	Improve motor cooling: improve ventilation of the installation room; clean the cooling unit
	Motor soiled	Clean motor cooling air supply
	Excessive system pressure	Exchange oil separator cartridge
	Excessive network pressure	Reduce line pressure to prevent compr. building up a compr. load above approved max. pressure
	PTC resistor defective or aged	Overhaul motor

FAULT	Possible cause	Rectification
5 	System pressure too high	Oil separator soiled Clean or change oil separator
		Ball valve on the compressor delivery closed Open ball valve
		Pressure value P_{max} set too high Check or set pressure value P_{max}
		Minimum pressure check valve does not open correctly Check minimum pressure check valve and have it replaced by BOGE-Service personnel, if necessary
13 	Frequency converter/motor	Motor overload! Power input too high caused by undervoltage Ensure correct voltage conditions: Constant voltage in accordance with IEC 38
		Insufficient cooling of motor / frequency converter Ensure better cooling of motor / frequency converter: improve ventilation of the installation room; clean cooling unit and supply air filter
		Motor soiled Clean motor cooling air supply
		Excessive system pressure Exchange oil separator cartridge
		Network pressure p_{target}/p_{max} too high Reduce net pressure to prevent compressor building up a compression load above approved max. pressure
		PTC resistor defective or aged Overhaul motor
14	Temperature too low	Ambient temperature too low Apply anti-freeze measures
16 	Network pressure transmitter faulty	Network pressure transmitter defective or wire breakage Replace network pressure transmitter or re-establish electrical connection
25	Reconciliation error Control unit EPROM	Error loading software. Control unit defective Reload software or have control replaced by BOGE-Service personnel
27	Control unit ON key  does not open	Control unit defective Have control replaced by BOGE-Service personnel

Warning messages of the control

WARNING	Possible cause	Rectification
10 	Motor servicing due Servicing intervals	see operating instructions for servicing
11 	Compressor servicing due Servicing intervals	see operating instructions for servicing
15	Suction control and/or ventilation Warning	Check suction controller Check solenoid valve Check continuous output control (option)
18	Fault of an external control Master control faulty	Check supply voltage of master control. Parameterization of external output release. Otherwise have control repaired or replaced by BOGE- Service personnel.
19	Power-up phases too short Coil short circuit ,Solenoid valve' or ,Delta contactor' → according to the per- missible amount of motor cycle switches automatically increased delay time	Have coil replaced by BOGE-Service personnel, check lines and have them repaired, if necessary.
20	Continuous contact of an external control Master control faulty	Check supply voltage of master control. Parameterization of external output release. Otherwise have control repaired or replaced by BOGE- Service personnel.
21 	Receiver inspection due or replace wearing parts Servicing intervals	Inspect receiver acc. to local rules and/or replace wearing parts
29	Control unit ENTER key  does not open Control unit defective	Have control replaced by BOGE-Service personnel

